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**Proust et al.**

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(54) **SYSTEM FOR MANAGING MULTIPLE SUBSCRIPTIONS IN A UICC**

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(52) **U.S. Cl.**

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(58) **Field of Classification Search**

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See application file for complete search history.

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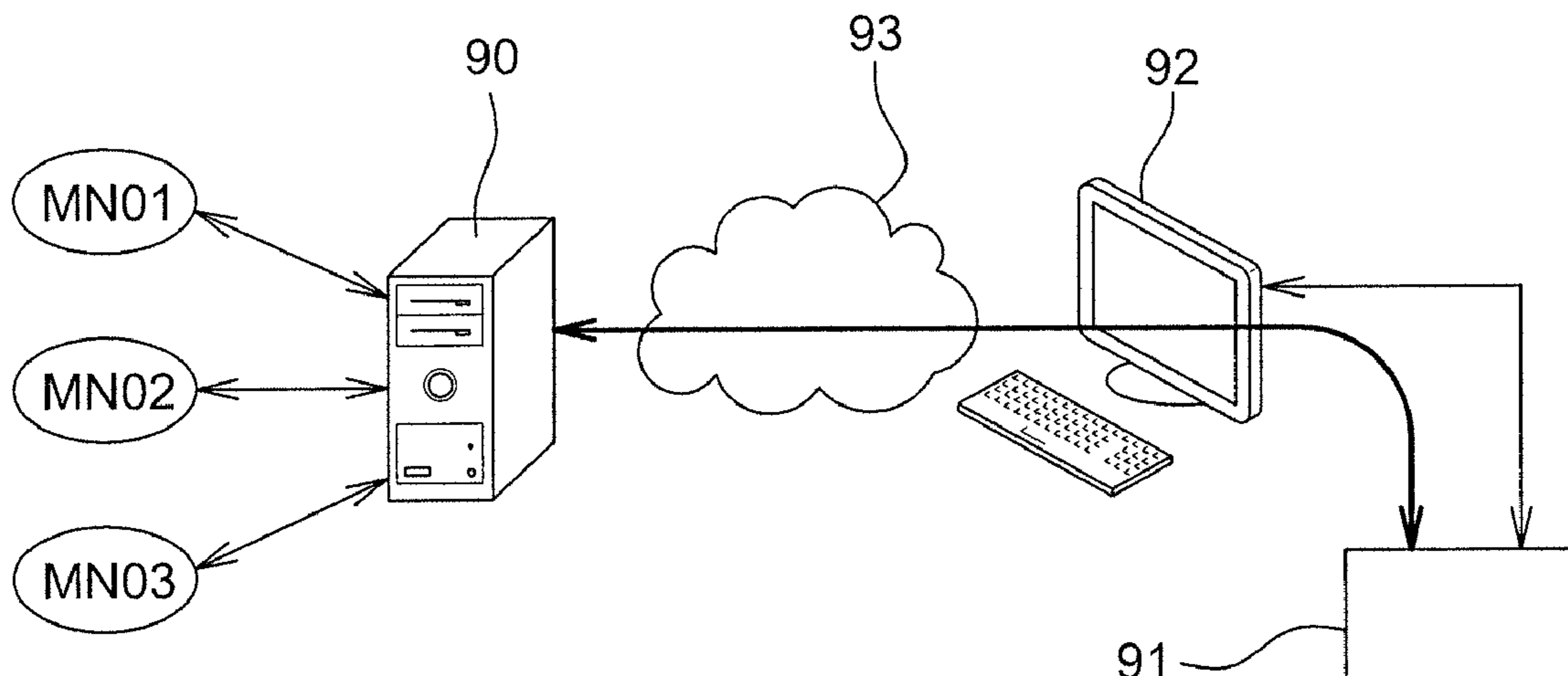
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(57) **ABSTRACT**

The invention relates to a system for managing multiple subscriptions in a UICC, this system comprising a central server able to manage subscriptions stored on a UICC comprised in a mobile terminal in the field, at the request of a subscriber of one of these subscriptions.

**7 Claims, 2 Drawing Sheets**



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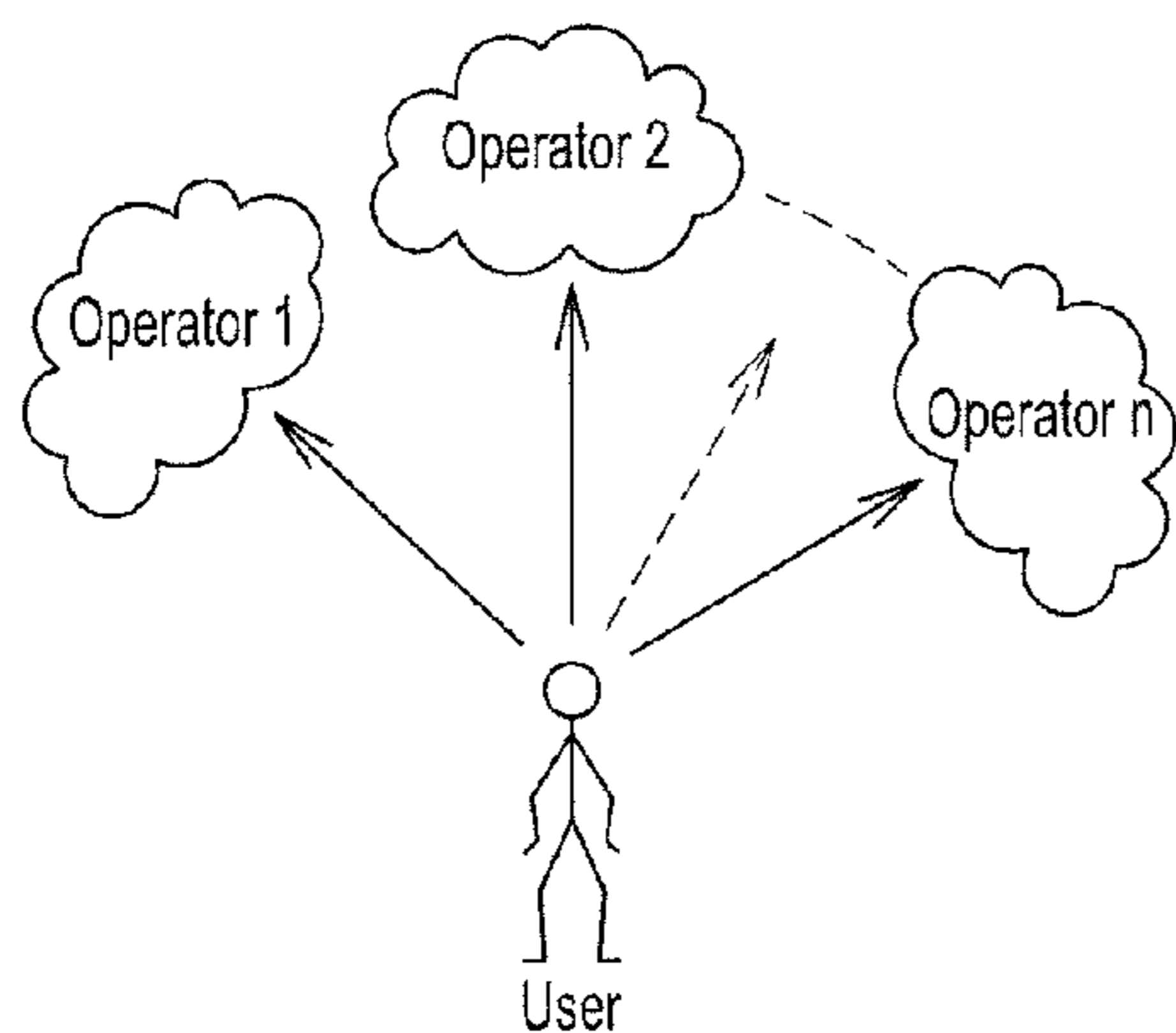


Fig. 1

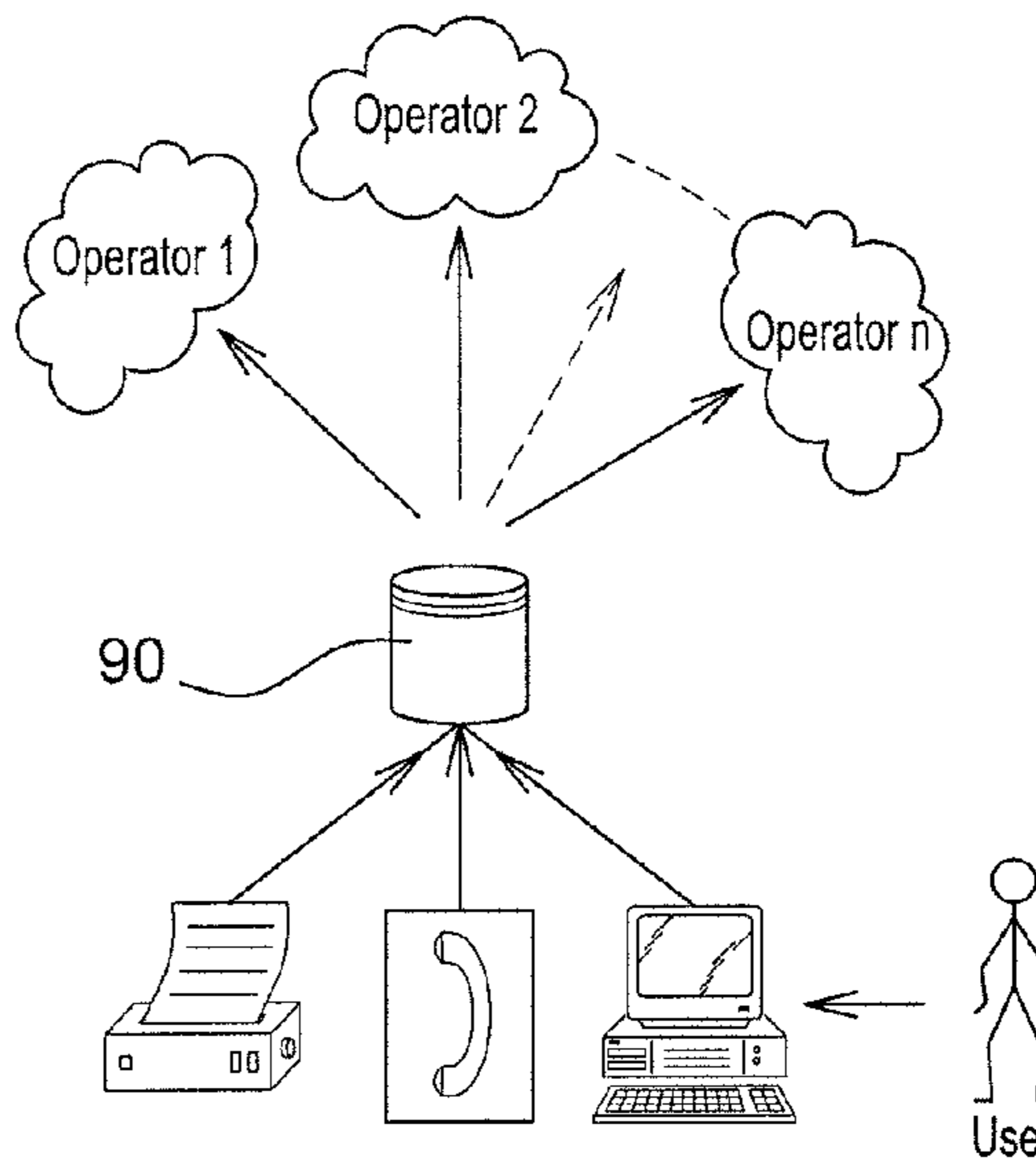


Fig. 2

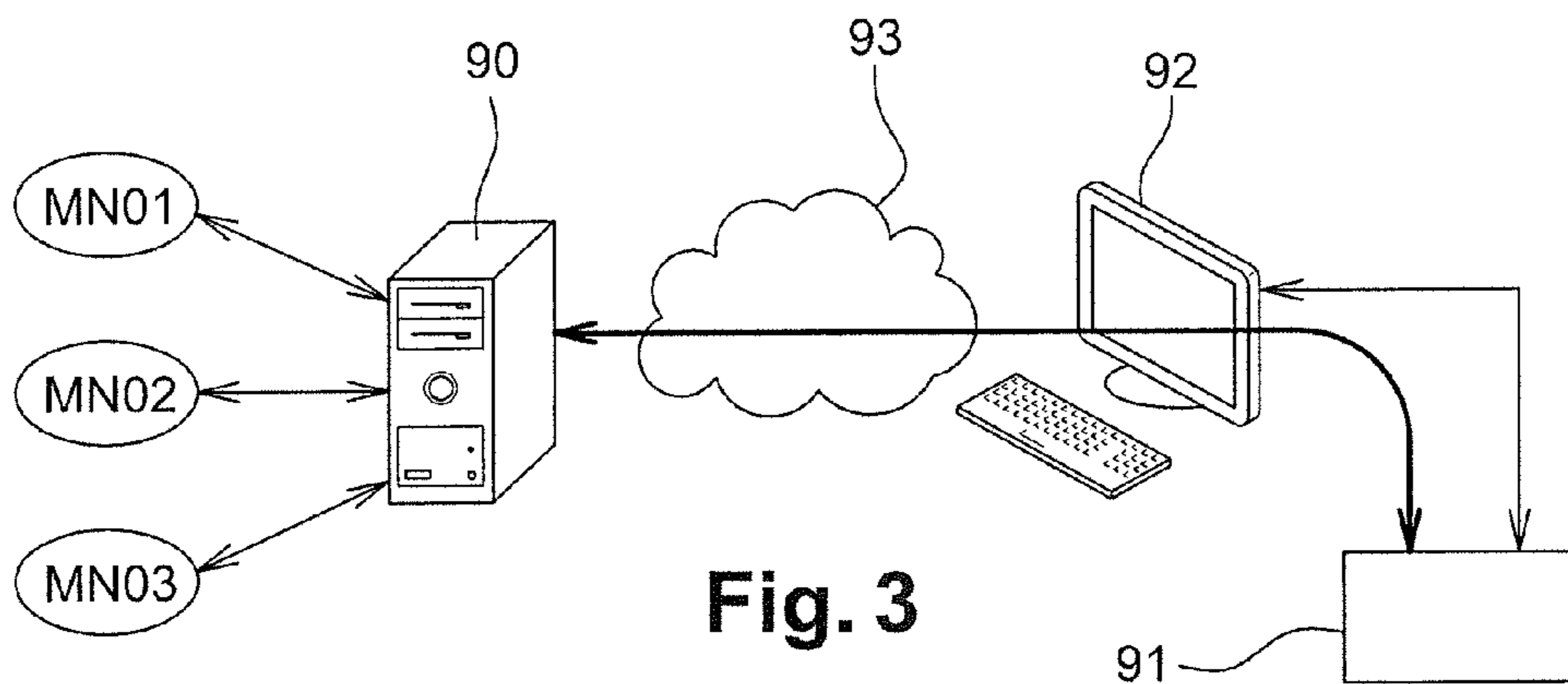


Fig. 3

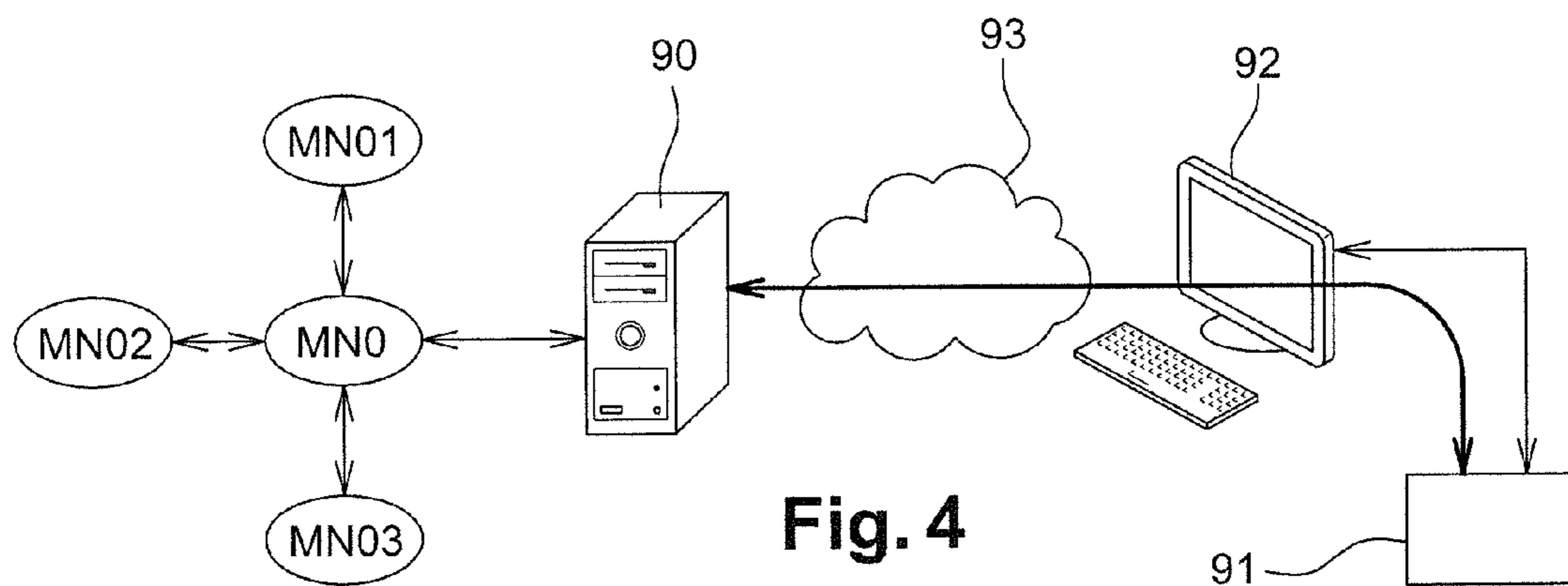


Fig. 4

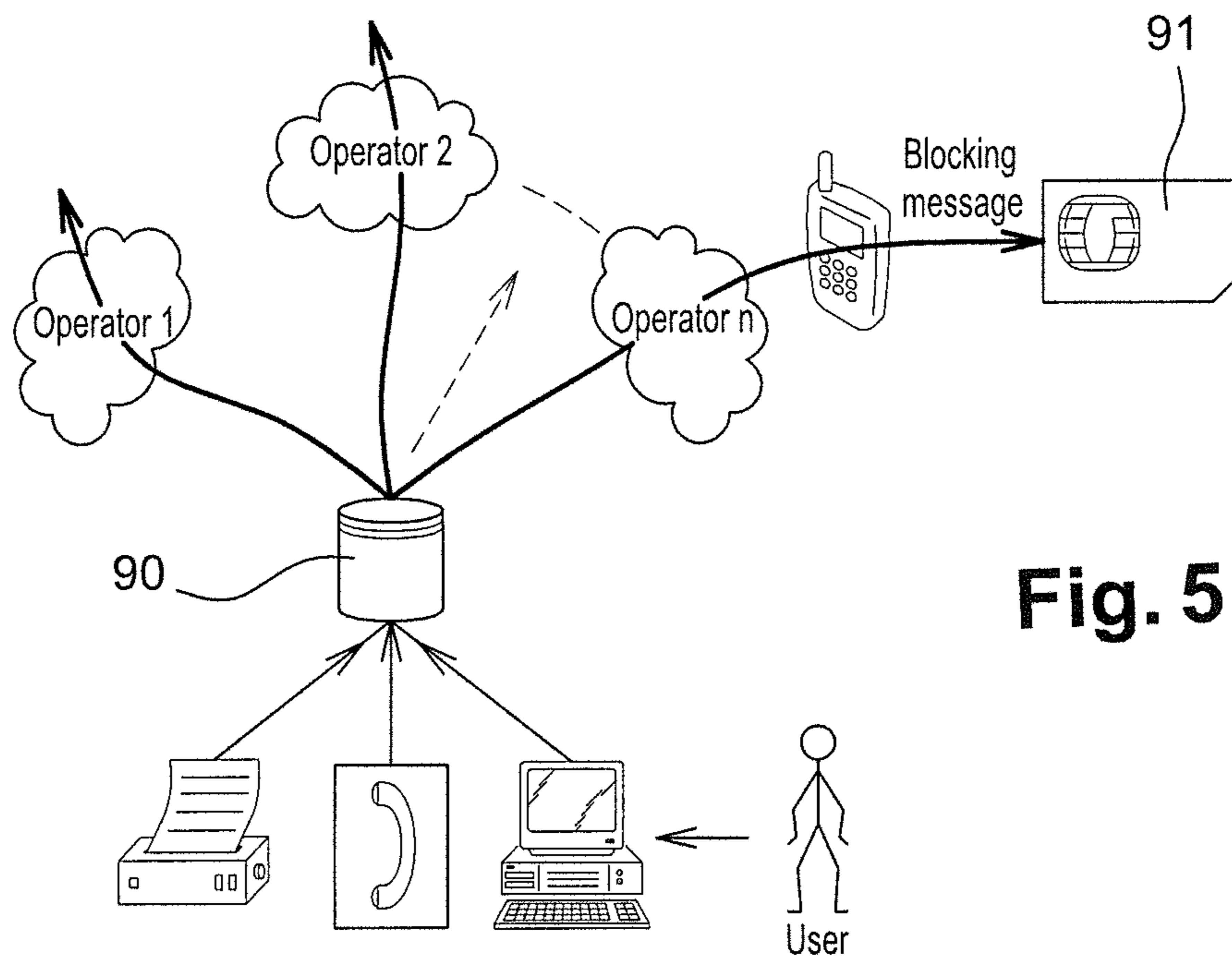


Fig. 5

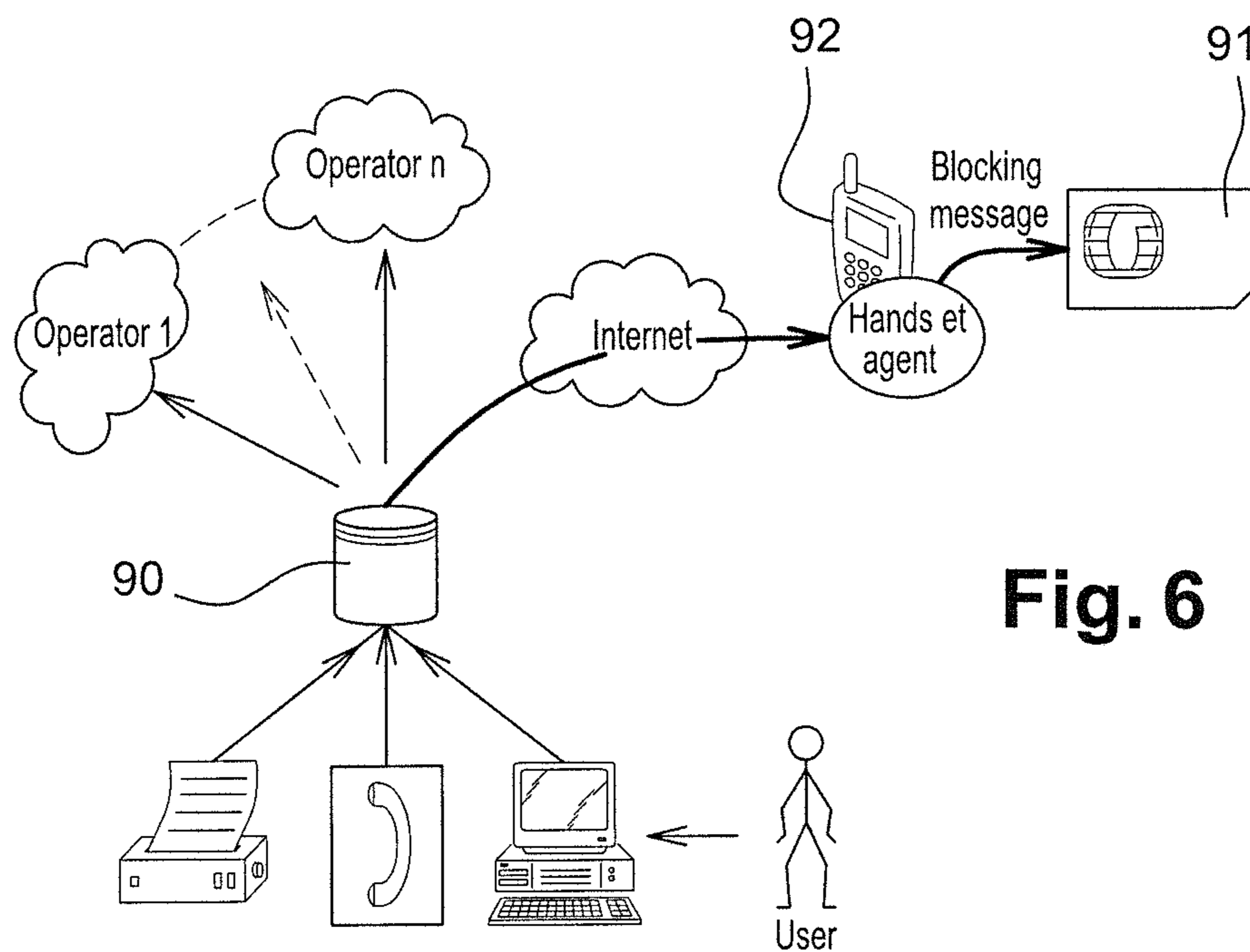


Fig. 6

## SYSTEM FOR MANAGING MULTIPLE SUBSCRIPTIONS IN A UICC

This disclosure is a national phase of PCT/EP2011/071785, filed Dec. 5, 2011, a continuation of U.S. application Ser. No. 13/312,309, filed Dec. 6, 2011, and claims priority to European Application No. 10306359.0, filed Dec. 6, 2010, the disclosures of which are hereby incorporated by reference.

The present invention concerns a system for managing multiple subscriptions in a UICC (Universal Integrated Circuit Card).

A UICC is a secure element that typically embeds Sim applications. It is installed, fixedly or not, in terminals, like for example mobile phones. In some cases, the terminals are constituted by machines that communicate with other machines for M2M (Machine to Machine) applications.

A UICC can be in the format of a smart card, or may be in any other format such as for example but not limited to a packaged chip as described in PCT/SE2008/050380, or any other format. It can be used in mobile terminals in GSM and UMTS networks for instance. The UICC ensures network authentication, integrity and security of all kinds of personal data.

In a GSM network, the UICC contains mainly a SIM application and in a UMTS network it is the USIM application. A UICC may contain several other applications, making it possible for the same smart card to give access to both GSM and UMTS networks, and also provide storage of a phone book and other applications. It is also possible to access a GSM network using an USIM application and it is possible to access UMTS networks using a SIM application with mobile terminals prepared for this. With the UMTS release 5 and later stage network like LTE, a new application, the IP multimedia Services Identity Module (ISIM) is required for services in the IMS (IP Multimedia Subsystem). The telephone book is a separate application and not part of either subscription information module.

In a CDMA network, the UICC contains a CSIM application, in addition to 3GPP USIM and SIM applications. A card with all three features is called a removable user identity card, or R-UIM. Thus, the R-UIM card can be inserted into CDMA, GSM, or UMTS handsets, and will work in all three cases.

In 2G networks, the SIM card and SIM application were bound together, so that "SIM card" could mean the physical card, or any physical card with the SIM application.

The UICC smart card consists of a CPU, ROM, RAM, EEPROM and I/O circuits. Early versions consisted of the whole full-size (85x54 mm, ISO/IEC 7810 ID-1) smart card. Soon the race for smaller telephones called for a smaller version of the card.

Since the card slot is standardized, a subscriber can easily move their wireless account and phone number from one handset to another. This will also transfer their phone book and text messages. Similarly, usually a subscriber can change carriers by inserting a new carrier's UICC card into their existing handset. However, it is not always possible because some carriers (e.g. in U.S.) SIM-LOCK the phones that they sell, thus preventing competitor carriers' cards being used.

The integration of the ETSI framework and the Application management framework of Global Platform is standardized in the UICC configuration.

UICCs are standardized by 3GPP and ETSI.

A UICC can normally be removed from a mobile terminal, for example when the user wants to change his mobile

terminal. After having inserted his UICC in his new terminal, the user will still have access to his applications, contacts and credentials (network operator).

It is also known to solder or weld the UICC in a terminal, in order to get it dependent of this terminal. This is done in M2M (Machine to Machine) applications. The same objective is reached when a chip (a secure element) containing the SIM or USIM applications and files is contained in the terminal. The chip is for example soldered to the motherboard of the terminal or machine and constitutes an e-UICC.

A parallel can be done between an e-UICC and UICCs that are not totally linked to devices but that are removable with difficulty because they are not intended to be removed, located in terminals that are distant or deeply integrated in machines. A special form factor of the UICC (very small for example and therefore not easy to handle) can also be a reason to consider it as in fact integrated in a terminal. The same applies when a UICC is integrated in a machine that is not intended to be opened.

In the next description, welded UICCs or chips containing or designed to contain the same applications than UICCs will generally be called embedded UICCs or embedded secure elements (in contrast to removable UICCs or removable secure elements). This will also apply to UICCs or secure elements that are removable with difficulty.

### BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a schematic illustration of the relationship of a user to multiple network operator;

FIGS. 2 and 3 illustrate embodiments of a system in which a user is associated with a plurality of network operators;

FIG. 4 illustrates an embodiment in which a user is associated with a single network operator;

FIGS. 5 and 6 illustrate embodiments in which a central server sends a message to a UICC.

### DETAILED DESCRIPTION

The present invention concerns a centralized service that can notably be used for lost or stolen mobile devices.

This invention aims to simplify procedures for a user that has lost his mobile phone and who has multiple subscriptions on the UICC it contains. The UICC can be removable or not.

Today it is more and more common for a user to have multiple telecommunications subscriptions available on his mobile. Several examples can be mentioned:

Mobile phones featuring multiple UICC slots;

The dual IMSI cards that allow two different subscriptions (e.g.: one personal and one professional subscription or two (or more) subscriptions from different countries for cross-border workers);

In Brazil, it is mandatory to have an emergency call on all new vehicles. They are equipped with so called white SIM pre-loaded with one subscription for each MNO of the country.

With several subscriptions in his UICC, it is a burden for the user to call all hotlines from different operators to block all his subscriptions, if his mobile device has been stolen or lost.

In addition, as in the Brazilian case, the user may not even know (or have forgotten) the activated subscriptions from all the pre-loaded subscriptions on his device.

This situation can be described by FIG. 1 which is self-explanatory.

The invention proposes to provide a unique centralized service for lost and stolen mobile phones that will be able to perform an action on mobile device on the user's behalf.

The invention proposes a system for managing multiple subscriptions in a UICC, the system comprising a central server able to manage subscriptions stored on a UICC comprised in a mobile terminal in the field, at the request of a subscriber of one of these subscriptions.

Preferably, the central server is connected to a plurality of MNOs.

In another embodiment, the central server is connected to a unique MNO.

The management request is preferably made from the subscriber to the central server.

In another embodiment, the management request is made from the subscriber to one of the MNOs.

Preferably, the management of subscriptions consists in at least one of the following tasks:

- Temporarily or definitively block one or several subscriptions;
- Temporarily or definitively block one or several services from one or several subscriptions;
- Send short message to try to warn with the person handling the terminal;
- Geo-localize the terminal;
- Recovery of the data on the terminal and the UICC;
- Deletion or encryption of the data on the terminal;
- Selection of a specific application that will allow to re-activate one of several subscriptions if the terminal is rediscovered.

The invention proposes a system for managing multiple subscriptions in a UICC, the system comprising a central server able to manage subscriptions stored on a UICC comprised in a mobile terminal in the field.

FIG. 3 represents such a system.

In FIG. 3, a central server 90 manages subscriptions stored in a UICC 91 comprised in a terminal 92. The central server 90 manages these subscriptions through a network 93, for example Internet. Central server 90 is connected to different telecommunication networks of operators MNO1 to MNO3.

In another configuration of the system represented in FIG. 4, the central server is connected to a single operator's network (MNO) and communicates with the other networks MNO1 to MNO3 through this network MNO.

Central server 90 can act as a manager of the subscriptions present on UICC 91. He can for example install a new subscription on the UICC, at the request of the user of terminal 92.

The system according to this invention allows a user that has lost his terminal to contact a single entity, the central server 90, in order to ask to this entity to manage its subscriptions. Such a management of subscriptions can for example consist in:

- Temporarily or definitively block one or several subscriptions;
- Temporarily or definitively block one or several services from one or several subscriptions;
- Send short messages to try to warn the person handling the terminal;
- Geo-localize the terminal;
- Recovery of the data on the terminal and the UICC;
- Deleting or encrypting the data present on the terminal;
- Selecting a specific application that will allow to re-activate one of several subscriptions if the terminal is rediscovered.

This management also applies in case of a stolen terminal.

In order to contact the central server 90, the user can contact directly the central server 90, as shown in FIG. 2. He can contact the server 90 by fax, phone or over the Internet. Since the server 90 knows which subscriptions have been installed on the lost/stolen UICC, it will be able to take the appropriate actions, at the request of the user.

An alternative for the user is to contact one of his MNOs who will warn the central server 90. The latter will take the appropriate actions.

Alternatively, as shown in FIG. 5, the central server 90 may try to send a short message to a specific application located in the UICC 91 that will directly perform the action on the UICC 91 instead of performing it in all the networks. As the central server 90 may not be aware of the currently active subscription (and the associated MSISDN), it will try to reach the UICC with all the potential MSISDN

A third alternative depicted in FIG. 6 would be to reach the UICC 91 via another network than a 2G/3G one like Wi-Fi or even a wired network. In this case, the central server 90 will try to reach an agent on the terminal 92 that will forward the messages to the UICC 91 and perform actions.

The main advantage of the invention is that it provides a convenient and fast way to block all subscriptions related to lost or stolen mobile terminals.

The invention claimed is:

1. System for managing multiple subscriptions in a UICC, said system comprising a central server able to manage a plurality of subscriptions stored on a UICC comprised in a mobile terminal in the field in a manner to block all subscriptions stored on said UICC, at the request of a subscriber of one of the plurality of subscriptions, wherein said central server is connected to a plurality of mobile network operators (MNOs).
2. System according to claim 1, wherein said request is made from said subscriber to said central server.
3. System according to claim 1, wherein said request is made from said subscriber to one of said MNOs.
4. System according to claim 1, wherein said management of subscriptions comprises at least one of the following tasks:
  - Temporarily or definitively block one or several services from one or several subscriptions;
  - Send short message to try to warn a person handling said terminal;
  - Geo-localize said terminal;
  - Recovery of data on said terminal and said UICC;
  - Deletion or encryption of the data on said terminal;
  - Selection of a specific application that will enable one of several subscriptions to be re-activated if said terminal is rediscovered.
5. System according to claim 1, wherein said UICC is removable from said mobile terminal.
6. System according to claim 1, wherein said UICC is not removable from said mobile terminal.
7. A central server for managing multiple subscriptions in a UICC, said central server being configured to:
  - manage a plurality of subscriptions stored on a UICC comprised in a mobile terminal in the field; and
  - block all subscriptions stored on said UICC at the request of a subscriber of one of the plurality of subscriptions, wherein said central server is connected to a plurality of mobile network operators (MNOs).